

3.2 Stabilization and Solidification

Theory

Stabilization - in-situ neutralization - change toxicity or solubility

Solidification - encapsulation into monolithic solid

eg. sludges, liquids, lagoon sediments.

S/S reagent types:

Organic - (polyethylene, asphalt) Thermo plastic encapsulation
-eg Radioactive wastes

Inorganic - (Cementing agents [lime, cement]; Bulking agents adsorption capacity)
eg flyashes, pozzolans.

Strength and Durability:

↑ with ↓ in voids

Also index properties: Suspended solids, pumpability

Density

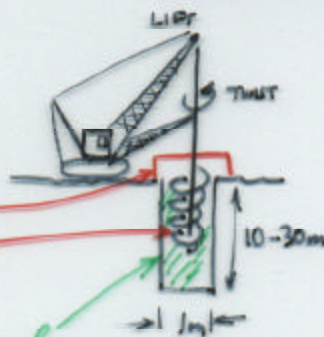
Permeability

Strength/durability (wet/dry & freeze/thaw)

Contaminant leaching (EPTOX, TCLP)

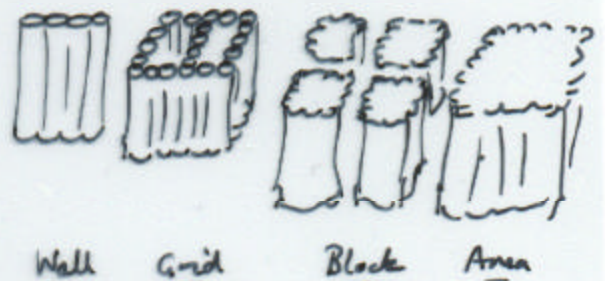
Field Implementation

Vacuum hood
Rotating auger



Materials - including admixtures for
strength & permeability

Coverage Types.



Level of Demonstration

Developed in 1950s

Applied in sand, silty clays $K = 2 \times 10^{-2}$ cm/s PCBs to 1000 ppm

15 m deep soils contaminated

Reagent addition .18 lb reagent / 20 lb dry soil

$K = 10^{-7}$ cm/s $q_u = 410$ psi

Volume ↑ 8.5%

TCLP tests → no PCBs in leachate

Applicability/Limitations

Well proven and effective remediation method

Good candidate for DNAPLs since thoroughly mixed.

— preventing migration from remediation zone.

Application to 25% by weight of agencies

Will penetrate drums etc. but not large boulders.

Costs.

SSM and Deep SM — \$20-50/m³ and \$100-200/m³, respectively
excluding reagent costs.